

Track 2, Session 1b – Energy Efficiency: Not Just New Light Bulbs

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**Pacific Gas and
Electric Company**

Climate change is all over the news



Moving to a Greener Tomorrow

“I say the debate is over. We know the science. We see the threat. And we know the time for action is now. Global warming and the pollution and burning of fossil fuels that cause it are threats we see here in California and everywhere around the world.”

Governor Arnold Schwarzenegger,
World Environment Day Conference,
June 1, 2005, San Francisco

“The link between greenhouse gas emissions and the Earth’s warming climate is convincing, the potential consequences are serious and the need for action is urgent.”

Peter Darbee,
Chairman, CEO and President PG&E Corporation,
PG&E *Global Climate Change* report

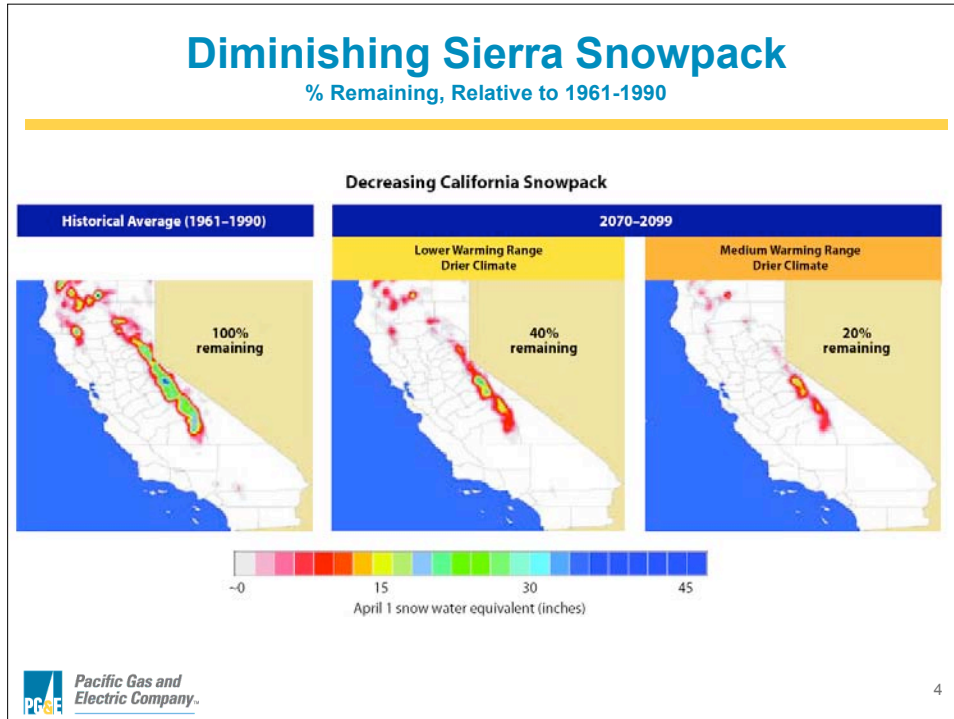
“We have been living for far too long on borrowed time and borrowed dimes. We need to get back to work on our country and on our planet. The hour is late, the stakes couldn’t be higher, the project couldn’t be harder, the payoff couldn’t be greater.”


Thomas L. Friedman, *Hot, Flat and Crowded*

PG&E’s Stance on Climate Change

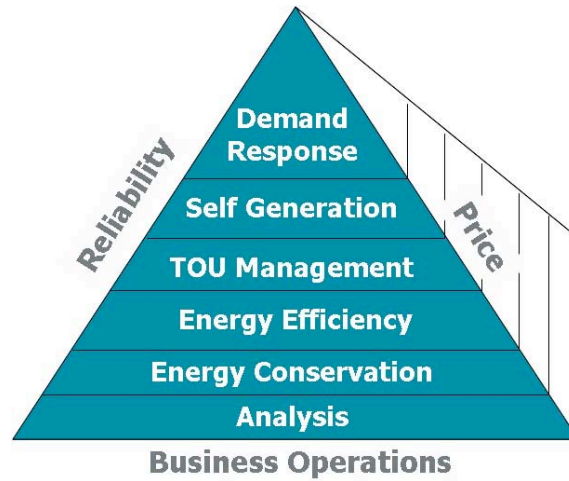
- The link between greenhouse gas emissions and the Earth’s warming climate is convincing.
- The potential consequences of global climate change are serious.
- The electric and natural gas sectors are the largest contributors to U.S. greenhouse gas emissions.
- We have an obligation to find responsible and effective solutions to the threats posed by global climate change and to take immediate action.



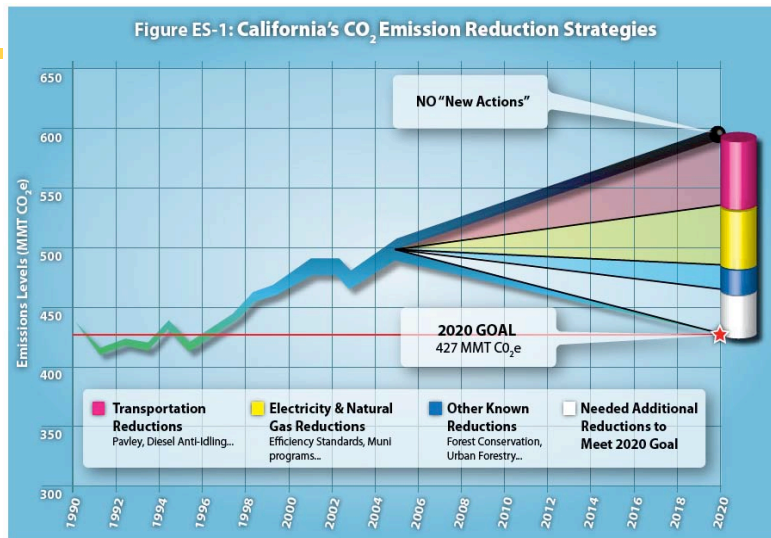


- ## How Californians Can Help Mitigate Climate Change
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- **Energy Efficiency**
 - Access to funding for energy efficiency programs - \$1 Billion for 2006-2008
 - 82 Customer Programs targeted to each class of customer
 - Three delivery channels – Third Party (48 programs), Partnerships (20 programs) and Core PG&E programs (14 market programs)
 - **Demand Response** - temporary electric capacity on very short notice for spikes in load or short term deficiencies in supply
 - Energy Use Audits
 - Technical Assistance
 - Automated Demand Response
 - **Solar**
 - California Solar Initiative funding and support - \$2 Billion statewide
 - Statewide goal: 3,000 MW of new solar generation by 2017
 - **ClimateSmart (PG&E)**
 - Allows customers to combat climate change by offsetting the greenhouse gas emissions associated with their energy use
- 
Pacific Gas and Electric Company.
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Integrated Demand Side Management Model



AB 32 Reduction Target



Source: California Energy Commission, Climate Action Team data.
 On a per-capita basis, this means reducing our annual emissions of 14 tons of carbon dioxide for every man, woman and child in California down to about 10 tons per person by 2020.

Putting Energy Efficiency First

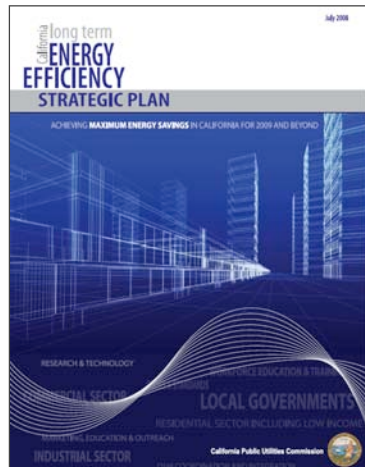
“Energy efficiency is California’s highest-priority resource for meeting its energy needs in a clean, reliable, and low-cost manner.”

California Public Utilities Commission’s 2006 publication,
Energy Efficiency: California’s Highest-Priority Resource

“Energy efficiency is the lowest-cost way to meet customers’ energy needs.”

PG&E’s *Global Climate Change* report

California Long Term Energy Efficiency Strategic Plan (Final July 2008)



- Lays out broad strategic vision and goals for California: 2009 and beyond
- Emerging Technology, Mass Market, Target Market and Codes and Standards Programs will play key role in implementing plan
- Requires enhanced coordination with between groups

Keys to Energy Efficiency Success in California

- Revenue/sales decoupling mechanisms are paired with annual rate adjustment mechanism
- Sustained, deep commitment by regulators, state lawmakers, utilities and other stakeholders
- Growing interest and commitment by the public to improve the environment and mitigate climate change
- General agreement that utilities have been and continue to be a key player in delivering energy efficiency programs and savings to customers
- Aggressive efficiency improvements in building codes and appliance standards
- Manufacturers and distributors are included in efficiency efforts
- California utilities are recognized by the customer as energy efficiency and demand response experts

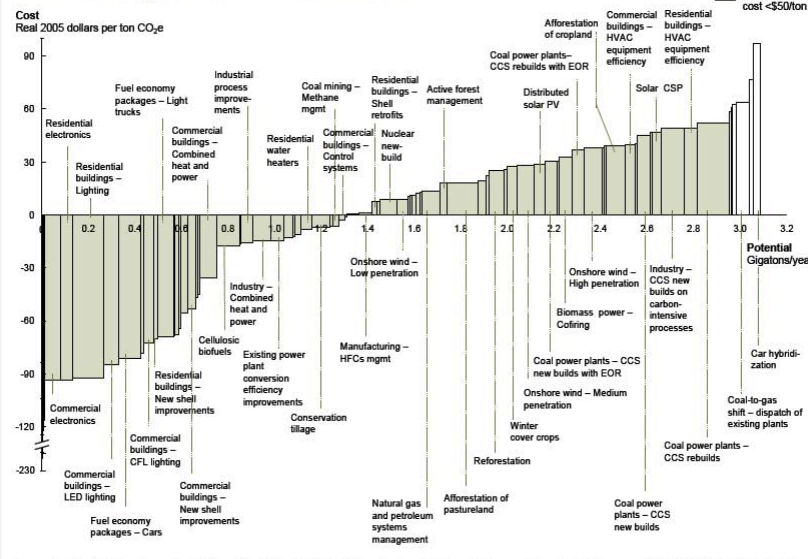
Incenting Energy Efficiency: “Decoupling”

- Many rate designs create financial disincentives for utilities to promote energy efficiency.
- California’s model of decoupling removes these disincentives.
 - Utility revenues and earnings are independent of actual energy sales.
- Decoupling eliminates the upside that comes with selling ever-increasing amounts of energy, and it helps promote broad, long-term environmental goals.
- Under California’s decoupling framework, the state’s utilities collect no more and no less than the revenues authorized to run their business and provide a fair return to investors.
 - If sales rise above forecast levels, the extra revenues go back to customers, rather than to the bottom line.
 - If sales fall below forecast levels, utilities are assured they can recover the shortfall going forward.
- Decoupling removes the financial disincentive for utilities to promote energy efficiency.

Energy Efficiency as a Resource

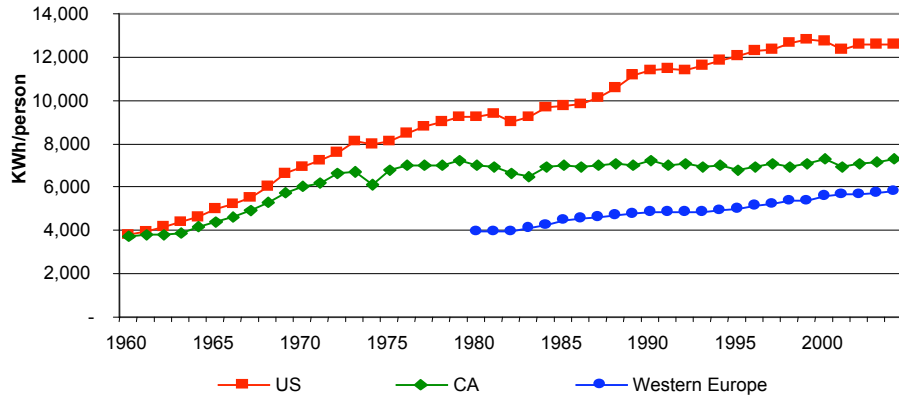
- A kilowatt-hour saved from energy efficiency does just as much work as a kilowatt-hour from a power plant
- But a kilowatt-hour from energy efficiency is preferable:
 - Does not produce any greenhouse gases
 - Does not incur transmission, distribution or transformation losses
 - Does not require the permitting or construction of a power plant or transmission lines
 - It is quick to “construct” and begins to “produce” power almost immediately

U.S. mid-range abatement curve – 2030



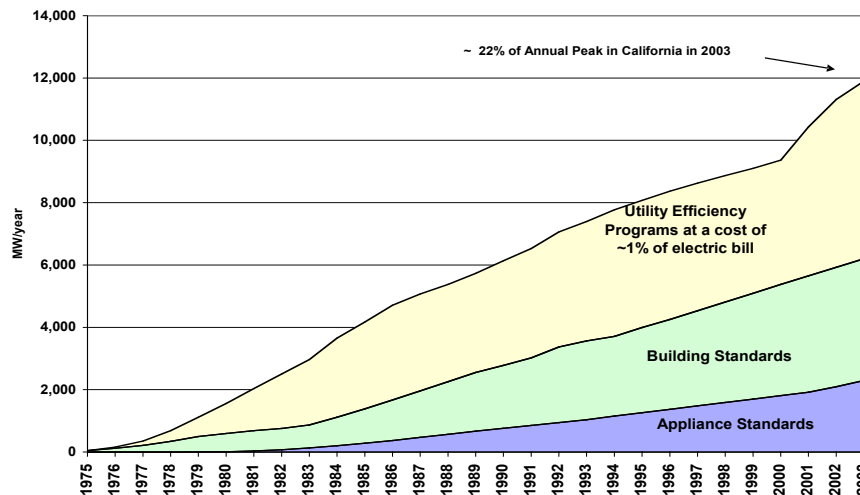
30+ Years of Energy Efficiency Success

- Energy efficiency programs have helped keep per capita electricity consumption in California flat since 1976
- PG&E's programs alone have avoided the release of over 135 million tons of CO2 into the atmosphere over the same period



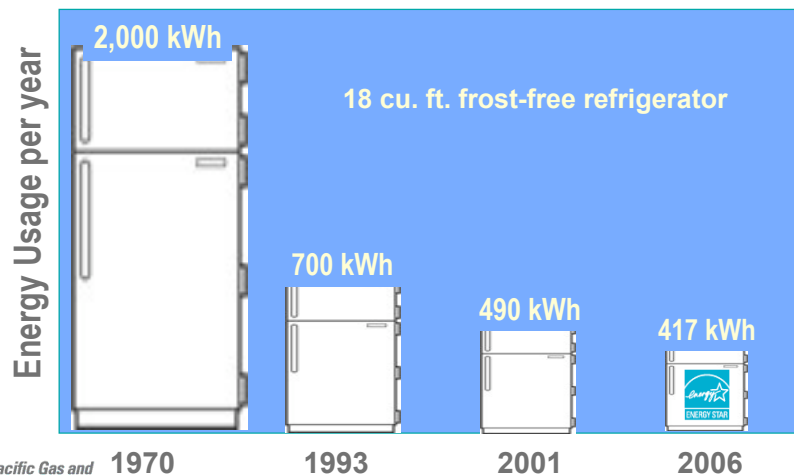
Pacific Gas and Electric Company. Courtesy Art Rosenfeld, California Energy Commission. Note: 2005 – 2008 are forecast data. 14

Annual Peak Savings From Efficiency Programs and Standards



Pacific Gas and Electric Company. Graph courtesy of Art Rosenfeld, California Energy Commission. 15

Appliance Standards – A Big Impact



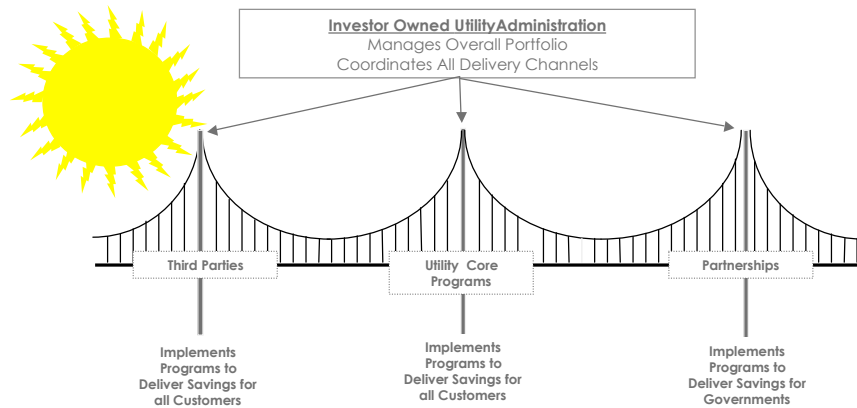
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2006 - 2008 Energy Efficiency Portfolio: Focus on the Customer

- Portfolio includes: financial incentives and rebates, training, education, energy audits, emerging technology projects, energy codes and standards support, marketing and outreach, and evaluation activities
- Multiple delivery channel opportunities: utility programs, partnerships, third party programs
- Mass Market: single family, multifamily and small business customers
- Targeted Markets:
 - Agriculture & Food Processing
 - Hospitality & Lodging
 - Health Care & Biotech
 - High Tech
 - Large Commercial & Institutional
 - Manufacturing & Heavy Industry
 - Residential New Construction
 - Retail
 - Schools, Colleges & Universities

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Tying it all Together



Energy Efficiency: “Cashback 1 – 2 – 3” +

- Step 1: No Cost “Practices”
 - Awareness !
 - Turn out the lights
 - Control major users carefully
 - Find out what the users are: Energy Audits and Ratings
- Step 2: Low Cost “Measures”
 - Compact Fluorescent Lighting
 - Low Water Fixtures
 - Better Controls: Clock Thermostat, Power Strip, Timers, Photocells
- Step 3: Investments
 - Upgrade Building Envelope
 - Mechanical Equipment Replacement
 - Generate Your Own Electricity: Solar P/V
- Step +: Mitigate the Remainder with “Climate Smart”

Awareness: Energy Analysis and Audits a First Step

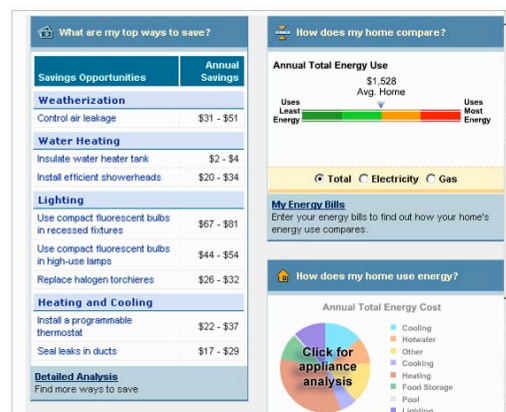
Types of Energy Audits

- Residential Customers
 - Online
 - Mail-In
- Small to Medium Businesses
 - Online
 - Mail-In
 - CD-Rom
 - Phone
- Medium to Large Businesses
 - On-site Audit
 - Targeted Energy Audit
 - Integrated Audit

Use SmartEnergy™ Analyzer

www.pge.com/energyanalyzer

- Create a profile of your home and appliances
- Identify how much energy and money you can save
- Create a customized energy plan



No Cost Practices

- Thermostat Settings: Heating at 68 degrees or lower, and A/C at 78 degrees or higher, 3 % to 5% saved per degree of difference.
- Set the water heater thermostat at 120 degrees or "low." If you have a dishwasher without a booster, use 140 or "normal"
- Wash only full loads in a dishwasher use the shortest cycle that will get your dishes clean. Let the dishes dry naturally.
- And full loads in cold water for clothes washer.
- Defrost refrigerators and freezers before ice buildup becomes ¼"
- Ventilate at night.
- Close the damper when the fireplace is not being used.
 - Don't use the fireplace and central heating simultaneously.

Recycle the Dinosaur Refrigerator

- Get rid of your second refrigerator and get a \$35 rebate from PG&E
- Older refrigerators use up to **up to three times as much energy** as newer ones
- They **add as much as \$250** to your annual energy bill
- Schedule a pickup
 - www.appliancerecycling.com
 - 1-800-299-7573
- 98% of the fridge is recycled



Low Cost Measures

- **Install Compact Fluorescent Lighting**
- Caulk windows, doors and anywhere air leaks in or out. Do not caulk around water heater and furnace exhaust pipes.
- Weatherstrip around windows and doors.
- Install energy-saver showerheads
- Install shades, awnings or sunscreens on windows facing south and/or west to block summer light. In winter, open shades on sunny days to help warm rooms.
- **Watch out for Vampires !!!**
 - **Try Power Strips when possible...**
 - TV <1 to 50+ w) Cable Box (20+ w)
 - ANYTHING WITH A REMOTE (1 to 5 w)

Energy Efficiency is SmartEnergy

- Energy efficiency is the ability to use less energy while producing the same amount of light, heat or other energy service
- Lighting Example:
 - Energy Conservation: Turn off a lamp as you leave a room.
 - Energy Efficiency: Replace the old incandescent bulb in the lamp with a compact fluorescent lamp (CFL). New CFLs produce the same pleasing light as incandescents, but use at least 75% less energy and last up to 10 times longer, saving as much as \$75 over the life of the bulb.



Reduce Water Use

- Install faucet aerators, ultra-low flow toilets and showerheads
- Install irrigation controllers or, even better, drought-tolerant landscaping
- Only run full dishwashers and loads of laundry
- Turn off the water when brushing teeth, washing dishes, etc.
- Take shorter showers



Investments in Energy Efficiency

- Look for Energy Star and Guide Labels



Based on standard U.S. Government tests

ENERGYGUIDE

Clothes Washer
Capacity: Standard
Top Loading

Model(s) VBXR1060V, YBXR1060V,
VBXR2070V, YBXR2070V

Compare the Energy Use of this Clothes Washer with Others Before You Buy.

This Model Uses
860 kWh/year

Energy use (kWh/year) range of all similar models

Uses Least Energy 312	Uses Most Energy 1306
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kWh/year (kilowatt-hours per year) is a measure of energy (electricity) use. Your utility company uses it to compute your bill. Only standard size, top loading clothes washers are used in this scale.

Clothes washers using more energy cost more to operate. This model's estimated yearly operating cost is:

\$71	\$29
when used with an electric water heater	when used with a natural gas water heater

Based on eight loads of clothes a week and a 1997 U.S. Government national average cost of 6.31¢ per kWh for electricity and \$1.26 per therm for natural gas. Your actual operating cost will vary depending on your local utility rates and your use of the product.

Important: Removal of this label before consumer purchase is a violation of Federal law (16 C.F.R. 429.2).

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Energy Efficiency Rebates

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Energy Efficiency for Home, Business and Multifamily Dwellings

One Application

Energy Efficiency Rebates for you:

- Home = 3 Technology Catalogs
- Business = 8 Technology Catalogs
- Multifamily Dwellings = 1 catalog with 5 technologies

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Energy Efficiency Rebates for Your Business

- App January 1, 2006 thru December 31, 2008
 - Pre-determined cash rebates for itemized measures
 - All business customers can use this regardless of size
 - No reservations required
 - Customers can do the project then apply for rebate
 - No customer caps
 - Eligibility
 - Electric or Gas Customer of utility offering rebates
 - Must pay into Public Purpose Programs

Product Catalogs for your Business

- Agricultural Products
- Appliances and General Improvements
- Boilers and Water Heaters
- Business Computing
- Food Service
- Heating Ventilation and Air Conditioning
- Lighting
- Refrigeration

Customized Energy Efficiency/Demand Response Program

- This program is for customers that are building new buildings or retrofitting existing buildings.
- Who is eligible for this program:
 - Nonresidential rate schedule customers
 - Non residential customers may have projects that utilize both the Cash Rebates and Customized Incentives
 - Residential rate schedule customers
 - New Construction Projects only

Customized Energy Efficiency/Demand Response Program

Types of projects can apply for these

- Non-Residential Projects
 - New construction /Addition
 - Systems Approach
 - Whole Building Approach
 - Renovation/Retrofit
- Residential Projects
 - New Construction
 - Performance Method
 - Prescriptive Method

Take Advantage of Residential Rebates

- Clothes Washers:
 - Less water + faster spin speed = top rebate
 - \$35 and \$75
- Dishwasher:
 - Less water = top rebate
 - \$30 and \$50
- Water Heater:
 - Gas EF \geq 62% overall efficiency \geq 30 gal \$30
 - Electric \geq 93% overall efficiency \geq 40 gal \$30
 - Tankless (residential retrofit does not qualify)



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Rebates

- Multi Speed Pool Pumps:
 - \$100
 - 50% and more savings
 - Quieter than single speed



Variable speed motor: central Furnace/AC:

- \$50
- Higher efficiency than standard motor
- Climate zones 11, 12, 13
- Whole House Fan:
 - \$100 per address
 - No climate zone restrictions



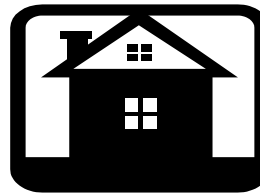
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Rebates

- Cool Roofs:
 - \$.10 to \$.20 sq. ft
 - Climate zones 2, 4, 11, 12, 13
 - Residential only



- Insulation:
 - \$.15 sq. ft
 - Attic and Walls only



Rebates at Point of Purchase

- LCD Monitors
 - \$10 Point of Purchase
- Compact Fluorescent Lamps
 - Look for products with this sticker:



Energy Efficiency Education & Training Programs

- Energy efficiency classes and trainings
 - Offered free throughout PG&E service area and by SCE (AgTAC), & Sempra
- Tool Lending Library
 - Loans building measurement equipment for energy analysis
- Private Consultations
 - Advise building professionals on energy-efficient design
- Have trained more than 500,000 people since 1979



Analysis of an architectural model using the heliodon, which simulates sunlight penetration and shading at different times of day and during different seasons



Education and Training: Target Audience

- Classes target building professionals and contractors who install energy-efficient equipment and influence customers' purchasing decisions
 - Architects and building designers
 - Builders
 - General contractors
 - Specialized equipment installers (HVAC, windows, insulation, solar, etc.)
 - Government code enforcement officials
 - Energy end-users



Classes Offered by PG&E Training Centers (partial list)

- **HVAC Quality Installation:** ACCA Standards; Air Flow; Proper Procedures for Charging Air Conditioners and Heat Pumps; Duct Testing and Sealing; Optimizing Performance; Ventilation
- **Codes and Standards Education and Training** (Title 24 2008)
- **Green Home Energy Retrofits** (Home Performance with Energy Star)
- **New Construction:** Advanced Framing for Energy and Resource Efficiency; LEED for Homes; Quality Insulation Installation; Zero Energy Homes
- **Water:** How Much? How Hot? How Fast?
- **Refrigeration** for Businesses
- **Lighting:** Fundamentals; Design Methods for Daylighting; Solid State Lighting: Technology Update

The Time to Act is NOW!



THANK YOU

- More Info: [www:](http://www.pge.com)
 - pge.com
 - pge.com/stockton
- cfs1@pge.com

